URS OPERATING SERVICES

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July 20, 1998

Mr. Peter Stevenson
On-Scene Coordinator
U.S Environmental Protection Agency, Region VIII
999 18th Street, Suite 500, Mail Code: 8EPR-ER
Denver, Colorado 80202

SUBJECT: START, EPA Region VIII, Contract No. 68-W5-0031, TDD 9712-0003
Addendum to Final Sampling and Analysis Plan for Removal Site Assessment - Vasquez Boulevard / I-70 Site, Denver, Colorado

Dear Peter:

Enclosed is the Addendum to Final Sampling and Analysis Plan for the Vasquez Boulevard / I-70 site in Denver, Colorado. Field work is projected to be completed in July and August 1998. This document is submitted for your approval.

If you have any questions, please call me at 291-8272.

Sincerely,

URS OPERATING SERVICES, INC.

Mark Rudolph
Environmental Scientist

cc: T. F. Staible/UOS
File/UOS

EPA ACTION BLOCK

- ◯ Approved
- ◯ Approved, TDD to follow
- ◯ Approved as corrected
- ◯ Disapproved
- ◯ Review with _____
- ◯ Original to _____
- ◯ Copy to _____
- ◯ Reply envelope enclosed

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Date By

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1.0 INTRODUCTION

URS Operating Services, Inc. (UOS) has been tasked by the U.S. Environmental Protection Agency (EPA), Region VIII, under Technical Direction Document #9712-0003, to conduct residential soil sampling in the Vasquez Boulevard I-70 site, Denver County, Colorado. This sampling effort will be Phase II of field work previously conducted for the Vasquez Boulevard / I-70 project. Sampling is projected to be completed during July and August 1998.

The sampling will include the collection of soil samples collected from parks, schools, and residences in the Elyria and Swansea neighborhoods. Expanded boundaries for the Phase II sampling effort are Colorado Boulevard on the east, the South Platte River on the west, East 35th Avenue on the south, and East 38th Avenue on the north. Additionally, properties not sampled during Phase I of this project where access was granted will be sampled as part of Phase II. A small portion of Globeville, located west of Interstate 25 (I-25) and south of Interstate 70 (I-70), will also be sampled. Properties sampled during Phase I of this project exhibiting concentrations of arsenic greater than 400 milligrams per kilogram (mg/kg) and/or lead greater than 2,000 mg/kg will be resampled for confirmation as described in Section 4.1, "Sampling Design."

All soil samples collected will be analyzed by an X-Ray Fluorescence Spectrometer (XRF) for arsenic and lead. Confirmation samples will be sieved with a 60-mesh sieve, and samples collected from properties not previously sampled will be sieved with a 10-mesh sieve. A minimum of ten percent of the total number of samples collected will be sent to an independent laboratory for confirmation of the XRF results.

This Addendum to the Final Sampling and Analysis Plan (SAP) is designed to guide field operations during the collection of samples, to describe the quality assurance/quality control (QA/QC) measures, and to list the procedures that have changed from the Final SAP dated March 19, 1998. This Addendum is intended to be used in conjunction with the Final SAP and the "Emergency Response Program (ERP) Draft Generic Quality Assurance Project Plan" (QAPP) (URS Operating Services, Inc. (UOS) 1998a; UOS 1997).

2.0 OBJECTIVES

To ensure that the data generated during this project are adequate to support removal decisions, a clear definition of project objectives and the decisions that will be made are presented here.

This study is being performed to determine if removal actions are required at residential and public locations near Vasquez Boulevard and I-70 where elevated levels of arsenic and/or lead may be present in residential or public soils. To support removal decisions, the concentrations of arsenic and lead in residential and public soils must present a sufficient risk to public health or the environment.

3.0 BACKGROUND

The Colorado Department of Public Health and Environment (CDPHE) collected 25 soil samples from residential yards in Elyria and Swansea on July 16, 1997. Samples were collected from residential yards located immediately north of the elevated portion of I-70 in the Swansea and Elyria neighborhoods of Denver, Colorado. More specifically, the samples were collected from the 4600 and 4700 blocks of Williams Street, Race Street, and Vine Street; the 4600 block of Franklin Street and Baldwin Court; the 4700 block of Fillmore Street and Gaylord Street; and the 4800 block of St. Paul Street (Colorado Department of Public Health and Environment (CDPHE) 1998). These 25 soil samples indicated levels of arsenic ranging from 12 mg/kg to 1,300 mg/kg, cadmium ranging from 1.8 mg/kg to 12 mg/kg, and lead ranging from 61 mg/kg to 660 mg/kg. With the discovery of these concentrations, the CDPHE asked the EPA to undertake the investigation of the extent of potential arsenic and lead present in surrounding soils (CDPHE 1998).

Initial sampling conducted by Superfund Technical Assessment and Response Team (START) for the EPA indicated that arsenic and lead contamination is widespread with little or no pattern to its geographic distribution. Elevated concentrations of arsenic and lead were detected along the southern boundaries of the primary project area. Since the predominant land use immediately south of 38th Avenue is primarily residential, the boundaries were expanded to include screening of these properties (UOS 1998b).

4.0 FIELD OPERATIONS

Field operations will be conducted as described in the Final SAP or as stated below. START Technical Standard Operating Procedures (TSOPs) are included as Appendix B of the final SAP (UOS 1995). A site specific health and safety plan will guide all field operations. A summary of sampling requirements is presented in Tables 1 and 2.

4.1 SAMPLING DESIGN

Sampling for Phase II of this project will be completed using two different sampling designs. The first sampling design will involve the collection of samples from properties that have not been sampled as part of this project. This sampling approach will remain the same as stated in the Final SAP.

The second sampling design will be for properties sampled during Phase I that contained elevated levels of arsenic (greater than 400 mg/kg) and/or lead (greater than 2,000 mg/kg). Confirmation samples will be collected using a random sampling approach. Each portion of the property (front yard, back yard, and side yard) will be divided using an imaginary grid and assign a series of numbers to the units of the grid. A total of five numbers or units of the grid will be selected using a random-numbers table. It should be noted that haphazardly selecting sample numbers or units is not a suitable substitute for a randomly selected sample using a random-numbers table. One five-point composite sample will then be collected from the 0- to 3-inch interval. Additionally, one grab sample will be collected from 12- to 16-inches below ground surface (bgs) from each portion of the property where Phase I sampling did not include a depth sample. Composite samples will be collected from each side of the property ~~capable of having samples collected from it.~~ instead 10' x 20' grabs in smaller areas If a garden is present, the garden will also be sampled regardless of whether or not it was sampled previously. Garden sampling will consist of a total of three random vertical composite samples, collected from the 0- to 6-inch interval, the 6- to 12-inch interval, and the 12- to 18-inch interval, respectively. These samples will be sieved with a 60-mesh sieve and analyzed with a TN Spectrace 9000 as described in the Final SAP (UOS 1998a). Additionally, aliquots of three confirmation samples will be analyzed for total metals and for toxicity characteristic leaching procedure (TCLP) metals. These three samples will be chosen by the 60-mesh XRF results exhibiting the highest concentration, a mean concentration, and the lowest concentration, respectively. This information will be required for the disposal of excavated soil.

All XRF and laboratory data will be validated using the applicable QA/QC procedures associated with its respective data type. Please refer to the ERP Generic QAPP for additional information pertaining to screening data and definitive data (UOS 1997).

4.2 SAMPLE LOCATIONS

The sampling will include soil samples collected from parks, schools, and residences in the Elyria and Swansea neighborhoods and the southern portion of Globeville, located west of I-25 and south of I-70. Expanded boundaries for the Phase II effort in Elyria and Swansea are Colorado Boulevard on the east, the South Platte River on the west, East 35th Avenue on the south, and East 38th Avenue on the north. Properties that were not sampled during Phase I of the project, along with adjacent properties or properties located immediately proximal to properties where elevated arsenic or lead concentrations were detected, will also be sampled, pending access.

Sample locations will not be photographed with a digital camera. During Phase I sampling, digital photographs did not sufficiently document pertinent sample location features and information for that specific sample. In lieu of photographs, detailed site sketches will be made of each property sampled.

4.3 SAMPLE COLLECTION

There will be no change to methods for sample collection for properties not sampled during Phase I of this project. Properties scheduled for confirmation sampling will be collected in the same manner as stated in the Final SAP with the exceptions stated in Section 4.1, "Sampling Design."

4.4 SAMPLE LOCATION IDENTIFICATION

Samples will be identified as described in the Final SAP with changes made to the street acronym list located in Attachment 1. Confirmation sample identification will include the street address preceded with a letter "C" instead of a letter "D" as stated in the Final SAP.

4.5 ANALYTICAL PARAMETERS

Soil samples will be analyzed using three TN Spectrace 9000 XRF instruments set up in the UOS Operations Center located at 401 Park Avenue West. Standard Operating Procedures (SOPs) for the XRF Spectrace 9000 may be found in the Environmental Response Teams (ERT) SOP #1713,

Spectrace 9000 Field Portable X-Ray Fluorescence Operating Procedures located in Appendix B of the Final SAP (Environmental Response Teams (ERT) 1995).

A minimum of 10 percent of the soil samples will be analyzed for confirmation through a privately contracted laboratory yet to be determined. These soil samples will be analyzed using SW846 Method 6010 for arsenic and lead. The acceptable holding time for these samples is six months.

4.6 STANDARD OPERATING PROCEDURES

Phase II soil samples will be collected in accordance with the START TSOPs included as Appendix B of the final SAP. Confirmation samples will be sieved using a 60-mesh sieve in accordance with EPA Bioavailability Study SOP 6 that describes specific XRF sample preparation, sieving, and guidelines for representativenessin XRF sample preparation. This SOP may be found in Attachment 2 of this Addendum.

5.0 QUALITY CONTROL REQUIREMENTS

Changes described below in this Section 5.0 apply to confirmation samples only.

5.1 LABORATORY QUALITY CONTROL

No change.

5.2 FIELD QUALITY CONTROL

5.2.1 XRF Analysis

No change.

5.2.2 XRF Sample Preparation

A portion of each confirmation sample will be removed as an aliquot to be utilized as the XRF sample. The remainder of the sample being archived under chain of custody.

XRF sample preparation for confirmation sampling will follow general guidelines set forth in SOP 6 from the EPA Bioavailability Study (EPA 1994). The procedures for 60 mesh sieve and analysis for this project are as follows:

Samples will be air-dried with minimal or no agitation at temperatures not to exceed 60 degrees Celsius. Samples will be sieved using nylon lead-free sieves provided with the following protocol:

a. Stack sieves so that the collection tray is on the bottom, the 60-mesh sieve (250 micrometers (μm)) sieve is above the collection tray, and the 10-mesh sieve is on the top.

b. Place approximately one-third of the dried sample onto the top screen and commence shaking (if mechanical) or swirling, tapping, and bumping the sieve stack until all the particles smaller than 10-mesh have fallen through the top sieve. The sample is not to be ground or forced through the sieve.

c. Remove the 10-mesh sieve, discard the coarse fraction, and continue shaking (if mechanical) or swirling, tapping, and bumping the 60-mesh sieve and collection tray, without grinding the sample against the wire, until most of the sample particles smaller than 60-mesh have fallen through the sieve onto the collection tray.

d. Remove the 60-mesh sieve, discard the coarse fraction, and empty the collection tray as necessary into an appropriate sized XRF sample cup. The sample container and any implement used for the sample transfer must be free of contamination.

e. Repeat steps a. through d. for the remainder of the sample in appropriately sized increments until enough soil has been sieved to fill the XRF sample cup.

f. Replace the 10-mesh and 60-mesh sieves, and the collection tray with new or decontaminated sieves and trays. Decontamination steps are outlined in Attachment B of the Final SAP.

5.2.3 Field Quality Control Samples

- One unfiltered rinsate blank will be collected each day during the duration of the sampling effort for Phase II of this project.

6.0 ASSESSMENT AND RESPONSE

No change.

7.0 RECONCILIATION WITH DATA QUALITY OBJECTIVES

No change.

8.0 DELIVERABLES AND PROJECT ORGANIZATION

No change.

9.0 LIST OF REFERENCES

Colorado Department of Public Health and Environment (CDPHE). 1998. XRF and ICP Analytical Data for 25 Soil Samples Collected in the Elyria and Swansea Neighborhoods. Received on January 5, 1998.

Environmental Response Team (ERT). 1995. "Spectrace 9000 Field Portable X-Ray Fluorescence Operating Procedures." January 26, 1995.

U.S. Environmental Protection Agency (EPA). 1991. Office of Emergency and Remedial Response, "Management of Investigation - Derived Wastes During Site Inspections OERR 9345.3-02."

U.S. Environmental Protection Agency (EPA). 1994. U.S. EPA Region VIII Bioavailability Study - Phase II Investigations - Standard Operating Procedures. September 1994.

URS Operating Services, Inc. (UOS). 1995. START Standard Operating Procedures, Volume 4: Technical Standard Operating Procedures. December 1995.

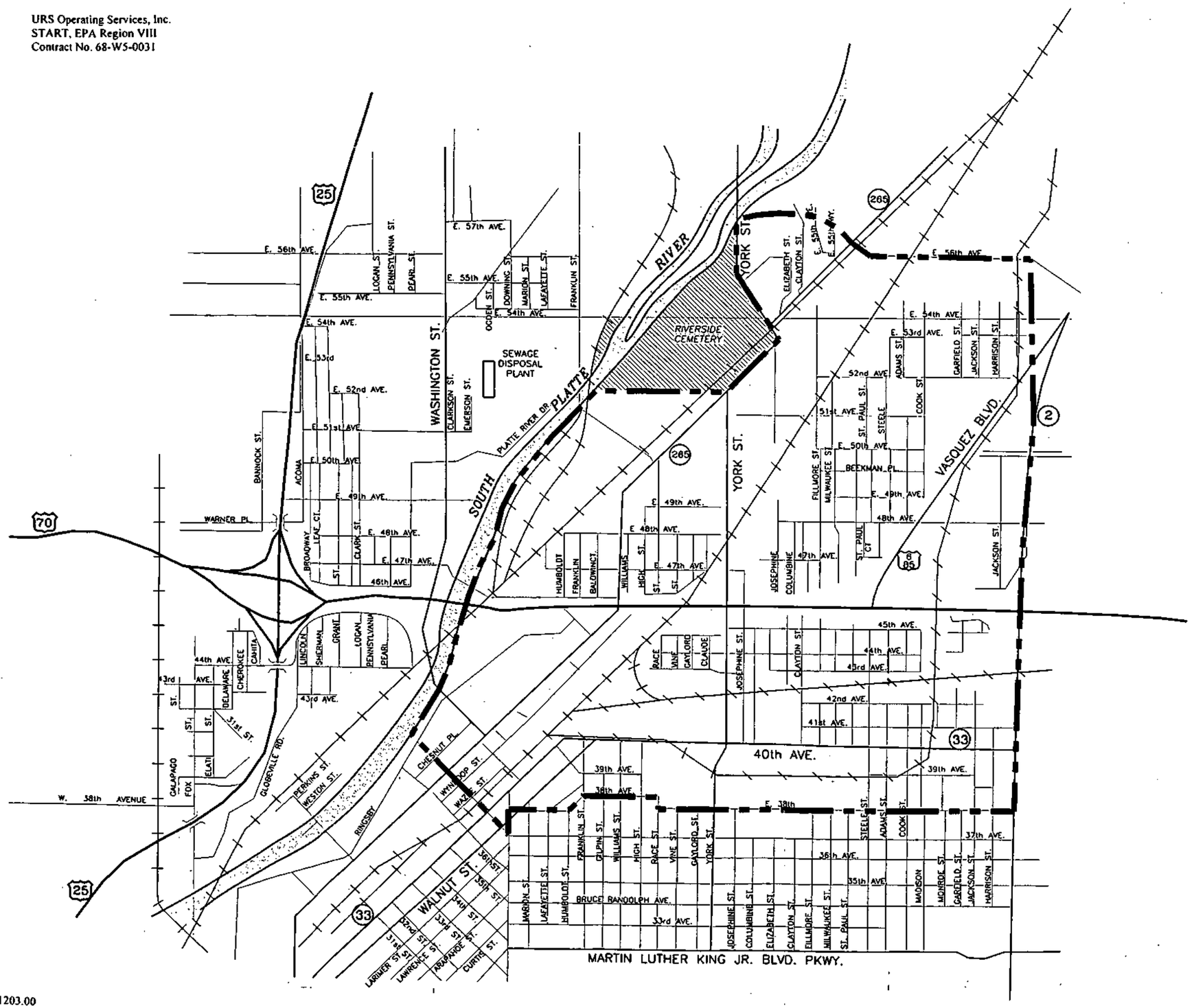
URS Operating Services, Inc. (UOS). 1996. "Field Sampler's Guide for Sample Collection and Documentation." August 1996.

URS Operating Services, Inc. (UOS). 1997. "Draft Emergency Response Program (ERP) Generic Quality Assurance Project Plan for the Superfund Technical Assessment and Response Team (START), EPA Region VIII." July 31, 1997.

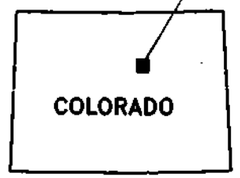
URS Operating Services, Inc. (UOS). 1998a. "Final Sampling and Analysis Plan for North Denver Residential Soils." March 19, 1998.

URS Operating Services, Inc. (UOS). 1998b. "Final Sampling Activities Report for North Denver Residential Soils." July 6, 1998.

URS Operating Services, Inc.
START, EPA Region VIII
Contract No. 68-W5-0031



SITE LOCATION



LEGEND

APPROXIMATE SITE LOCATION BOUNDARY

1000' 0 1000' 2000'

SCALE: 1" = 2000'

UOS - START
Job# 75-71203.00

VASQUEZ BLVD. / I-70 SITE
DENVER, CO.

SITE LOCATION MAP

Figure 1

July 1998

URS OPERATING SVCS.

f:/drawings/denver/site.dwg JLH (TEMI) 07-20-98

TABLE 1
Environmental and Quality Control Sample Quantities for Environmental Analyses

Sample Matrix	Analysis	Quality Control Samples				
		Lab QA/QC			Field QA/QC	
		Standard Reference Samples	Laboratory Blank	Matrix Spike and Duplicate	Field Replicates	Equipment Rinsate
Soil	XRF	1 per 20 samples	1 per 20 samples	N/A	N/A	N/A
Soil	ICP	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per day
Soil	TCLP Metals	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	N/A

1- No matrix spike performed during XRF analyses

TABLE 2
Environmental Sample Collection and Laboratory Analysis Specifications

Analysis[c]	Analytical Method	Reference	Container[a]	Required Volume	Preservation	Holding Time[b]
Arsenic, Lead - XRF	Spectrace 9000 SOP 1713	ERT 1995	XRF Sample Cup	1 oz	N/A	6 months
Arsenic, Lead [c] - ICP	6010B	SW846	XRF Sample Cup	1 oz	N/A	6 months
Total Metals[d] - ICP	6010B	SW846	XRF Sample Cup	1 oz	N/A	6 months
TCLP Metals [d] -	1311 - 6010B	SW846	HDPE	8 oz	N/A	6 months
Arsenic, Lead - Rinsate Blank	6010B	SW846	HDPE	1 Liter	HNO_3	6 months

a HDPE = high-density polyethylene bottle and cap.
b Holding times begin from the time of sample collection in the field.
c For properties not sampled during Phase I.
d For properties where confirmation sampling is being conducted.

TABLE 3
Quality Assurance Objectives for Environmental Samples

Analysis (for each matrix)	Analytical Method	Data Type	Units	Detection Limits	Accuracy %	Precision ±%	Completeness %
Soil - XRF	XRF	S/D	mg/kg	As - 40* Pb - 30*	75 - 125	±35	90
Soil - ICP	SW846 - 6010B	D	mg/kg	As, Pb <1 mg/kg	85 - 115	±20	90
Soil - TCLP Metals	SW846/6010	D	mg/l	As, Pb 1 mg/l	85 - 115	±20	90
Rinsate Blank - ICP	SW846 -6010B	D	µg/l	As, Pb 60, 50 µg/kg	85 - 115	±20	90

* Indicates that while this can readily be achieved, the actual detection limit varies on a daily basis and will be monitored to ensure that detection limits achieved are below specified screening levels

Data type refers to the following: S/D = non-definitive data with 10% definitive confirmation; D = definitive data

Attachment 1
Soils Sample Identification List

VASQUEZ BOULEVARD / I-70 SITE SOIL SAMPLE IDENTIFICATION

or "C" for confirmation samples

If numerical address is less than four digits, then N, S, E or W will be used for the first digit. [redacted]

Adams Street	AD	Ringsby Street	RI	Back Yard	[redacted]
Alice Court	AL	St. Paul Street	SS	Front Yard	
Arkins Street	AR	St. Paul Court	SC	Garden	
Baldwin Street	BA	Steele Street	ST	Playground	
Blake Street	BL	Thompson Court	TH	Side Yard	
Brighton Blvd	BR	Vasquez Blvd	VA	Vacant Lot	
Cahita Street	CA	Vine Street	VI		
Chestnut Place	CE	Walnut Street	WA		
Cherokee Street	CH	Washington Street	WS		
Claude Court	CL	Wazee Street	WZ		
Clayton Street	CY	Williams Street	WI		
Colorado Blvd	CO	Wynkoop Street	WY		
Columbine Street	CB	York Street	YO		
Cook Street	CK	E. 35th Avenue	35		
Delgany Street	DE	E. 36th Avenue	36		
Delaware Street	DL	E. 37th Avenue	37		
Elati Street	ET	E. 38th Avenue	38		
Elizabeth Street	EL	E. 39th Avenue	39		
Fillmore Street	FI	E. 40th Avenue	40		
Fox Street	FO	E. 41st Avenue	41		
Franklin Street	FR	E. 42nd Avenue	42		
Garfield Street	GA	E. 43rd Avenue or			
Gaylord Street	GY	W. 43rd Avenue	43		
Gilpin Street	GI	E. 44th Avenue or			
Harrison Street	HA	W. 44th Avenue	44		
High Street	HI	E. 45th Avenue	45		
Humboldt Street	HU	E. 46th Avenue	46		
Jackson Street	JA	E. 47th Avenue	47		
Josephine Street	JO	E. 48th Avenue	48		
Lafayette Street	LA	E. 49th Avenue	49		
Madison Street	MA	E. 50th Avenue	50		
Marion Street	MR	E. 51st Avenue	51		
Milwaukee Street	MI	E. 52nd Avenue	52		
Monroe Street	MO	E. 53rd Avenue	53		
National Western Drive or		E. 54th Avenue	54		
Packing House Road	PA	E. 55th Avenue	55		
Race Street	RA	E. 56th Avenue	56		

Attachment 2
US EPA Bioavailability Study SOP 6

Exhibit Copy
13 10/5/14

USEPA REGION VIII BIOAVAILABILITY STUDY
Phase II Investigations

Date: September 1994 (Rev. # 0) SOP No. # 6

Title: Collection, Preparation and Shipment of Test Materials

Total Pages 7

APPROVALS:

Chris Weis — Sep 28, 1994
Author — Date

Stan W. Coats — 9-29-94
Study Director — Date

SYNOPSIS: This protocol provides a consistent method for collection of specific lead-contaminated test materials. Adherence to these methods will ensure consistent, scientifically supportable sample collection under necessary chain-of-custody procedures in order to demonstrate integrity of the Phase II dosing material.

REVIEWS:

TEAM MEMBER	SIGNATURE/TITLE	DATE
EPA Region VIII	Toxicologist	9/28/94
Study QA Officer		9/29/94
Roy F. Weston, Inc.	WESTON Project Manager	9/29/94

COLLECTION, PREPARATION, AND SHIPMENT OF TEST MATERIALS

1.0 INTRODUCTION

Pursuant to discussions held during the meeting on Soil Selection for Phase II: Lead Bioavailability Study, held 27 October 1993, the following sample collection, preparation, and transmission procedure has been developed. Participants in this meeting included RPMs, toxicologists, and other end-users of the Phase II data results. Participants must record and store pertinent site-specific sample information independent of this procedure and submit copies of all information to WESTON for record archives.

Specific objectives of this protocol are:

(1) to specify a method for collecting lead-contaminated dosing materials to which children may plausibly be exposed in a manner that is reasonably consistent across different sites. It is intended that the materials collected from different sites will differ only in terms of their inherent chemical and physical properties with minimal influence from sample collection procedures;

(2) to ensure that dosing material collection is conducted according to strict chain-of-custody procedures to provide end users of the data confidence in EPA's ability to identify and trace all sample origins and transfers;

(3) to comply, to the extent possible, with procedures outlined in EPA Good Laboratory Practices (40 CFR part 792) for the conduct of animal studies pertaining to toxic environmental contaminants.

2.0 SAMPLE SELECTION

The primary reason for testing site-specific samples in the Phase II study is to obtain information that will improve the accuracy of exposure and risk calculations. Therefore, it is expected that site samples will be selected to be representative of materials which are of current or potential future human health concern. Samples may either be from discrete locations, or may be composites from an area. Samples may either be relatively pure mineral or physical forms, or may be mixtures that are typical of mixtures found on site. It is recommended that the input of all concerned parties be considered before final sample selection.

3.0 SAMPLE COLLECTION

3.1 Target Concentration

The concentration of lead in the material submitted must be high enough to provoke a measurable response in the animal test system (if the lead is bioavailable). The most convenient concentration is 5,000 to 10,000 ppm, but higher or lower concentrations are acceptable.

However, no sample less than 2500 ppm should be submitted without first discussing and receiving approval from the EPA regional toxicologist.

3.2 Amount Required

The target amount of material required is about 1 kg. Higher amounts may be needed if the concentration value is near the low end of the acceptable concentration range. Contact the EPA regional toxicologist if it is not possible to obtain this much material for testing. It should be noted that the material collected must be large enough to provide a split to the PRPs, if requested.

3.3 Detailed Field Collection Protocol

The samples collected for use in the bioavailability study will be collected according to Attachment 1 (Sample Collection and Management). Prior to this sample being submitted to WESTON for study characterization, an initial lead analysis will be conducted to ensure that the lead concentrations are within the target concentration range.

4.0 SAMPLE PREPARATION

1. Samples should be air-dried with minimal or no agitation at temperatures not to exceed 60 degrees Celsius.

2. Samples should then be sieved using nylon lead-free sieves provided with this protocol as follows:

   a. Stack sieves so that the collection tray is on the bottom, the 60-mesh (250 μm) sieve is above the collection tray, and the 10-mesh is on top.

   b. Place approximately one third of the dried sample onto the top screen and commence swirling, tapping, and bumping the sieve stack until all the particles smaller than 10-mesh have fallen through the top sieve. The sample is not to be ground or forced through the sieve.

   c. Remove the 10-mesh sieve, discard the coarse fraction, and continue swirling, tapping, and bumping the 60-mesh sieve and collection tray, without grinding the

sample against the wire, until most of the sample particles smaller than 60-mesh have fallen through the sieve into the collection tray.

d. Remove the 60-mesh sieve, discard the coarse fraction, and empty the collection tray as necessary into an appropriate size (16 to 24 ounce) laboratory clean glass sample container. The sample container and any implements used in the transfer of the sample from the collection tray to the sample container must be free of lead contamination.

e. Repeat steps a. through d. for the remainder of the sample in appropriately sized increments.

f. Replace the 60-mesh sieve with new 60-mesh sieve prior to preparation of another sample material. The collection pan may be "deconned" prior to any additional material preparation. Follow decontamination procedures described in Attachment 1.

5.0 SAMPLE LABELING

Each sample of test material must be labeled with the following information:

- Site name
- Sample description
- Sample collection date
- Initials of person collecting sample
- Head concentration value (mg/kg)

6.0 SAMPLE SHIPPING

1. Samples should be labeled as above, sealed, and shipped via the standard chain-of-custody procedure, as described in SOP 12.

2. Samples should be packaged in accordance with International Air Transport Association (IATA) Resolution 618 requirements and shipped to:

Gerald Almquist
Roy F. Weston, Inc.
215 Union Blvd., Suite 550
Lakewood, CO 80228

3. Please notify either Gerald Almquist or Bill Brattin at (303) 980-6800 prior to shipping the samples. Do not ship samples without verbal confirmation with either Mr. Almquist or Dr. Brattin.

4. WESTON will remove a portion of the sample for detailed geochemical separation and characterization prior to testing in the Phase II study. WESTON will then send the sample under chain-of custody procedures to the Principle Investigator (PI) for Phase II. All packages will be opened by the PI or authorized staff following chain-of-custody procedures. Receipt of all samples or test chemicals will be recorded. Chain-of-custody forms will remain attached to all test samples.

7.0 Storage of Test Materials.

All test samples will be retained in their original shipment containers and stored in a secure room that is locked at all times except when it is being used for preparation of doses or samples, or other operations associated with performance of these investigations. The locked room will have five keys. One each will be retained by the PI (Stan W. Casteel), the Director of the Diagnostic Lab (Harvey Gosser), Assistant to the Dean (Ben Riley), Project Research Assistant (Roberto E. Guzman), and Project Technician (Nancy Campbell). Access to the locked room will be restricted to the PI or dedicated staff authorized by the PI.

ATTACHMENT 1
MANAGEMENT OF SAMPLE COLLECTION AND PROCESSING

This section describes the methods and procedures to be used for sample collection and management during this field program including documentation of sampling events, sample labeling, storage, and equipment decontamination.

All information pertinent to the sampling activity (for example, date, site, and location) will be recorded in ink in a field activity logbook and will include entries describing the field conditions, weather conditions, and any unusual circumstances. Notes should be as descriptive and as inclusive as possible. A person reading the entries should be able to reconstruct the sampling situation from the recorded information. Language should be objective, factual, and free of personal feelings and inappropriate terminology. Field logs must be signed by the person recording as well as an observer. Any errors or mistakes in field recording must be initialed and dated by the recorder, along with a note explaining the change.

SAMPLE CONTROL

Field preparation requires organizing sample bottles (WESTON will provide uniform lead-free containers), sample labels, and documentation in an orderly, systematic manner that promotes consistency and traceability of all data. Many items should be completed before a sample is collected, including:

A. Recording all pertinent information (for example, date, site sample number, and location) in the logbook. Notations should also include descriptions of field conditions, unusual circumstances, and weather conditions.

B. Filling out the required information on the sample identification label and attaching the label to a sample bottle.

C. Completing initial information required on data collection forms.

Enter all information pertinent to a field activity in a bound logbook with numbered pages. The logbook should include at least the information listed below.

- Date and time of entry.
- Purpose of sampling.
- Name and address of field contact.
- Site identification.
- Sample identifier and size of sample taken.
- Description of sampling point.
- Date and time for collection of sample.
- Collector's sample identification number(s) and/or name.
- References of the sampling site (maps or photographs).
- Field observations and sampling locations.
- Associated field measurements.
- Method of sample collection. preservation techniques, and any deviations or anomalies from the approved methods or techniques.

Use EPA-CLP sample identification labels and tags for sample containers. Seal each sample container immediately after the sample is sieved and containerized and the container is labeled with waterproof black ink. Label tags may be filled out before collection to minimize the handling of the sample containers. Firmly attach the labels to the sample containers. The containers must be dry enough for gummed labels to be securely attached. Clear tape may be used to firmly affix sample labels to the containers.

The number of persons involved in collecting and handling samples should be kept to a minimum to prevent mislabeling, contamination, or mismanagement of the sample. Data collection forms must be completed at the time the sample is collected and have the sample collector(s) and an observer sign or initial them. Include the date and time of sample collection on each form.

EQUIPMENT DECONTAMINATION

All sampling equipment must be decontaminated, including shovels, scoops, split-spoons, and other similar sampling equipment.

Decontamination is achieved by washing with an Alconox® solution, followed by a rinse with tap water and deionized water. Equipment is allowed to air dry.

It is the primary responsibility of the site manager and the field QA/QC manager to ensure that proper decontamination procedures are followed and that all waste materials produced are properly stored or disposed. It is the responsibility of all personnel involved with sample collection and equipment decontamination to maintain a clean working environment and ensure that contaminants are not negligently introduced into the environment.

Decontamination Steps

1. The purpose of the initial step is to remove gross contamination. Remove any solid particles from the equipment or material by brushing and then rinsing with available tap water.

2. Wash sampling equipment with soap or detergent solution.

3. Rinse with tap water by submerging or spraying.

4. Rinse with 0.05 Molar HCL and distilled water solution.

5. Rinse thoroughly with distilled water.